Ecological Assessment within the Planning Process

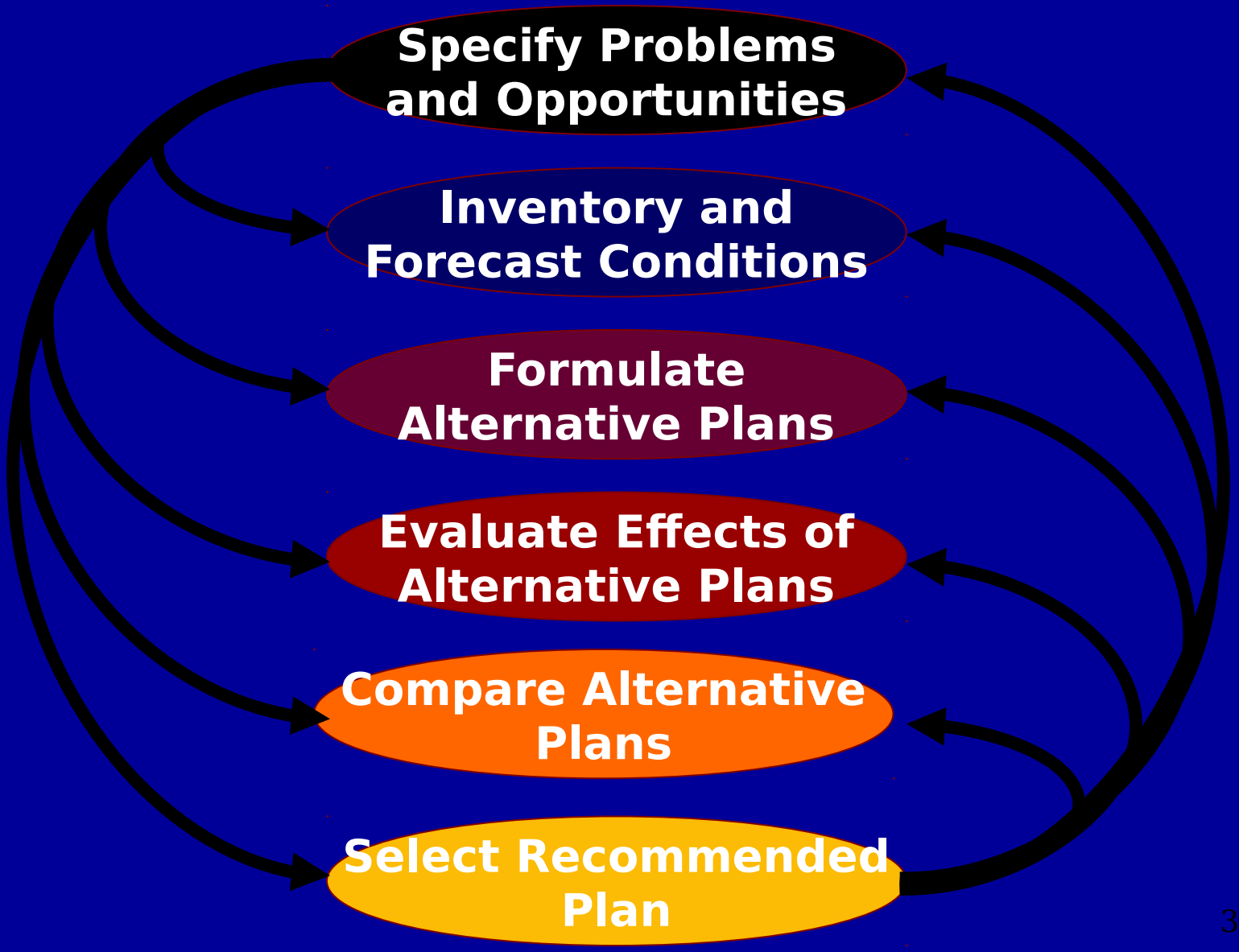
Ch 6 Mod 2

HO #s 15 & 15a

Module 6-2 Class Objectives

- Where in planning process do ecological assessments take place?
- Quantifying ecological outputs
- Steps of assessment (time and $)

Corps' Planning Steps



Quantifying Ecological Output

Biological Accounting System

- Currency = Habitat Units (HU's)

- Habitat Units = Quality X Quantity

How is Quality Derived?

Quality is measured as a Habitat Suitability Index or HSI which is derived from the measurement of limiting environmental factors called Life Requisites for a species or community.

Ecological Quality

Quality Index

$$= \frac{\text{Study Area Ecological Conditions}}{\text{Optimum Ecological Conditions}}$$

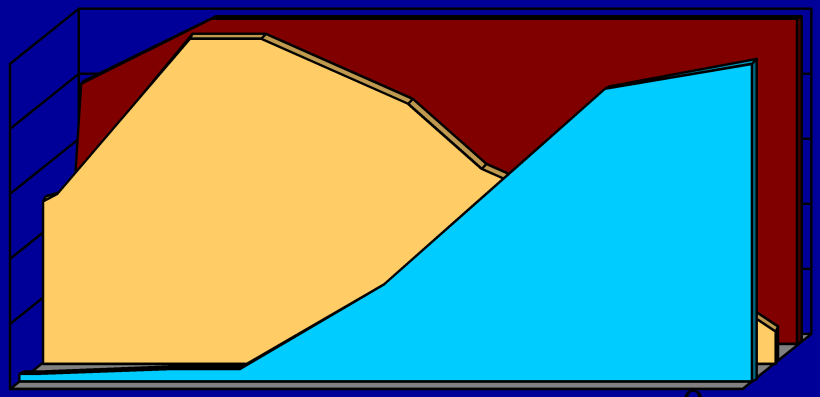
Score = 0.0 to 1.0

How is Quantity Derived?

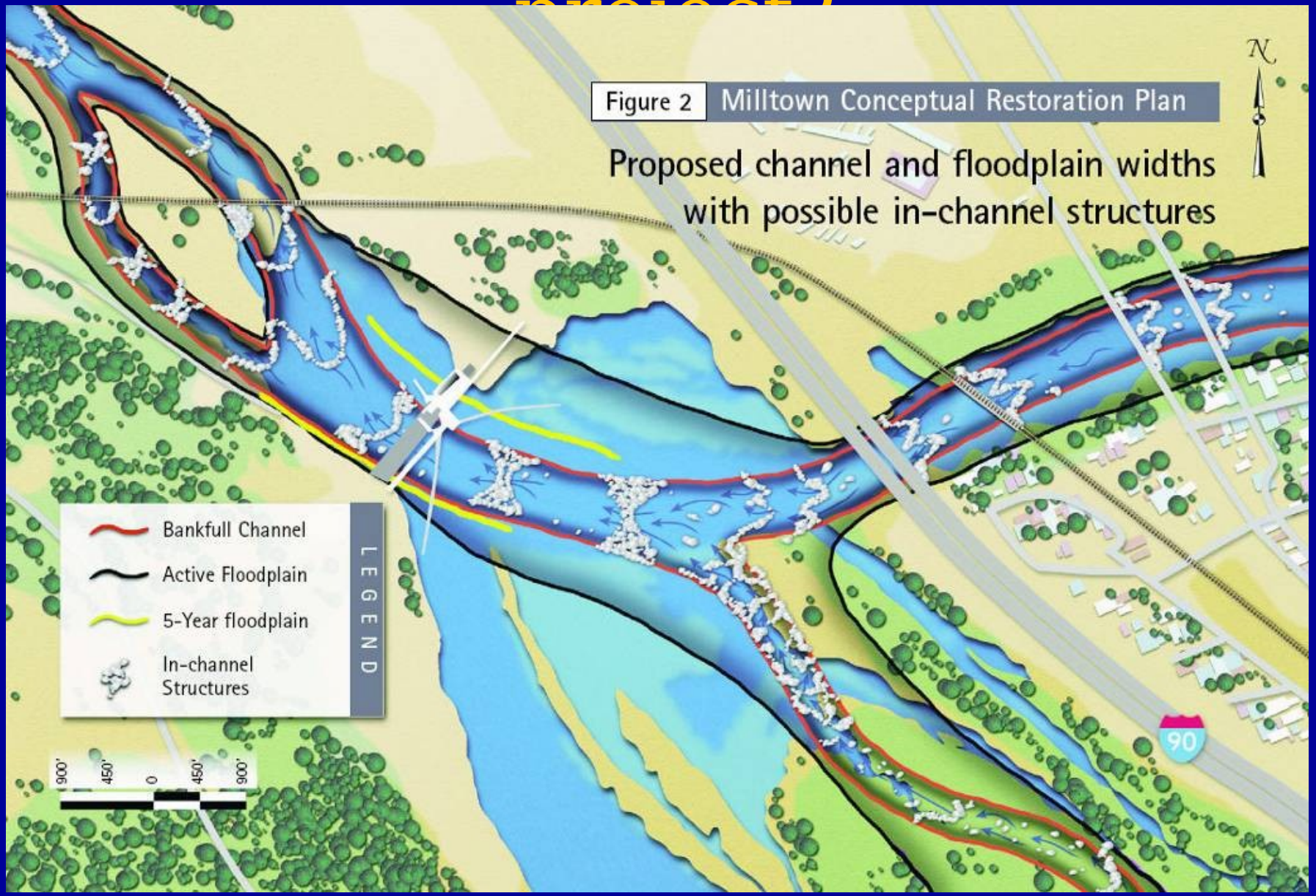
Quantity = the number of acres of a cover type.

HUs vs. AAHUs

- HUs = gains/losses for a single Target Year
- AAHUs = gains/losses averaged over the life of the project
- AAHU = Sum HUs for all years / # of years



How to assess/score a project?



Ecological Assessment Checklist

1. Build An Interagency Team
2. Classify, delineate & inventory habitats
3. Map the Cover/habitat Types
4. Determine Model Focus & Select, Modify or Create Model(s)
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10. Report the Results

Step 2 – Classify & Delineate

- Classification: systematic arrangement in groups or categories of habitat types.
- Delineation: process of marking a line on

the ground/map, delineating the boundary between the habitat types.

Classification

- Why do It?
  - To separate “like” from “unlike” things.
  - Increases accuracy in classification while decreasing sampling effort.
  - Sets the boundaries of a study area or an area we hope to influence.
  - Aids in the development of restoration endpoints by developing identifiable and compatible classes within the classification.
  - Display or communicates complex relationships more effectively for planning, restoration, and management.

Classification of:

- Life Forms
  - Taxonomic relationship, scientific name, e.g., plant keys
  - Species groups such as southeastern pine - hardwood, coldwater fishery
- Land Types, Land Use
  - Land use such as urban, agriculture, grassland, ephemeral stream
- Land Morphology
  - Environments such as bay, reef, prairie; topography
- Land Capability
  - NRCS classification, habitat “quality”

Inventory and Forecast Conditions

Classification Systems

- Cover Typing
- NWI
- Cowardin System **(USFWS 1979)**
- Ecoregions
- **Nature Conservancy National Vegetation Classification System (1994)**
- HGM **(1983)**

Handout #16

Classification of Wetlands & Deepwater Habitats of the United States (USFWS)

(Based on Hydrology & Vegetation)

Inventory and Forecast Conditions

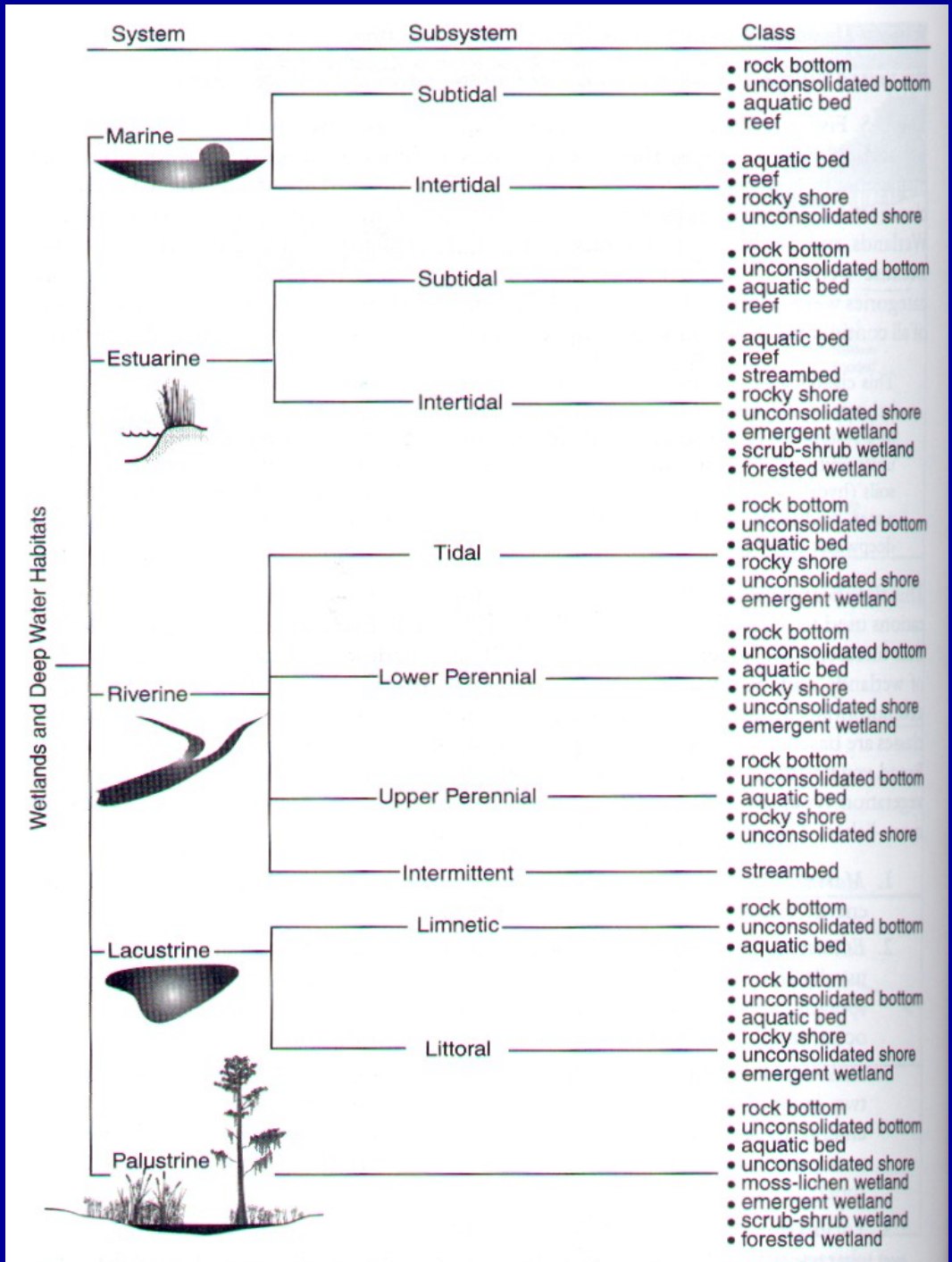
Systems: share similar hydrologic, geomorphologic, chemical, or biological factors

- *Marine*: open ocean overlying continental shelf
- *Estuarine*: deepwater tidal habitats and adjacent tidal wetlands usually semi-enclosed by land.
- *Riverine*: contain channel
- *Lacustrine*: lakes (depression, lacks vegetation > 30% or area, area > 8 ha, deepest part > 2m at low water.
- Palustrine: nontidal, less than 8 ha, deepest part < 2 m, salinity < 0.5 ppt.

http://www.fws.gov/nwi/Pubs_Reports/Class_Manual/class_titlepg.htm

Inventory and Forecast Conditions

USFWS Classification: basis for National Wetland Inventory (NWI)



Hydrogeomorphic Classification of Wetlands

- Hydrologic and geomorphic factors fundamentally control how wetlands function
- The Hydrogeomorphic Classification of Wetlands is based on three factors
  - Geomorphic setting
  - Water source
  - Hydrodynamics

HGM Classification
(A function based classification)

- *Geomorphic setting*: topographic location of wetland in the surrounding landscape:
  - depressional - riverine
  - fringe - slope
  - flats - peatlands
- *Water source*:
  precipitation, surface flow, and/or groundwater
- *Hydrodynamics*:
  direction & strength of water movement
  (e.g., vertical, unidirectional v.s. bidirectional)

Handout # 16

Inventory and Forecast Conditions

HGM Classification: Arkansas

CLASSIFICATION		
CLASS	**SUBCLASS**	**COMMUNITY TYPES**
DEPRESSIONS	Headwater Depression	Headwater Swamp
	Isolated Depression	Mountaintop Depression
		Sinkhole
		Sandpond
		Valley Train Pond
		Unconnected Alluvial Depression
	Connected Depression	Connected Floodplain Depression
FLATS	Alkali Flats	Alkali Wet Prairie
		Alkali Post Oak Flat
	Non-Alkali Flats	Wet Tallgrass Prairie
		Pine Flat
		Hardwood Flat
		Post Oak Flat

ftp://ftp-fc.sc.egov.usda.gov/WLI/HGM.pdf

The Nature Conservancy's Classification System

The U.S. National Vegetation Classification System Hierarchy		
Level	**Primary Basis for Classification**	**Example**
Class	Growth form and structure of vegetation	Woodland
Subclass	Growth form characteristics, e.g., leaf phenology	Deciduous Woodland
Group	Leaf types, corresponding to climate	Cold-deciduous Woodland
Subgroup	Relative human impact (natural/semi-natural, or cultural)	Natural/Semi-natural
Formation	Additional physiognomic and environmental factors, including hydrology	Temporarily Flooded Cold-deciduous Woodland
Alliance	Dominant/diagnostic species of uppermost or dominant stratum	*Populus deltoides* Temporarily Flooded Woodland Alliance
Association	Additional dominant/diagnostic species from any strata	*Populus deltoides* - (*Salix amygdaloides*) / *Salix exigua* Woodland

http://www.natureserve.org/publications/iceic/index.html

Inventory and Forecast Conditions

Classification

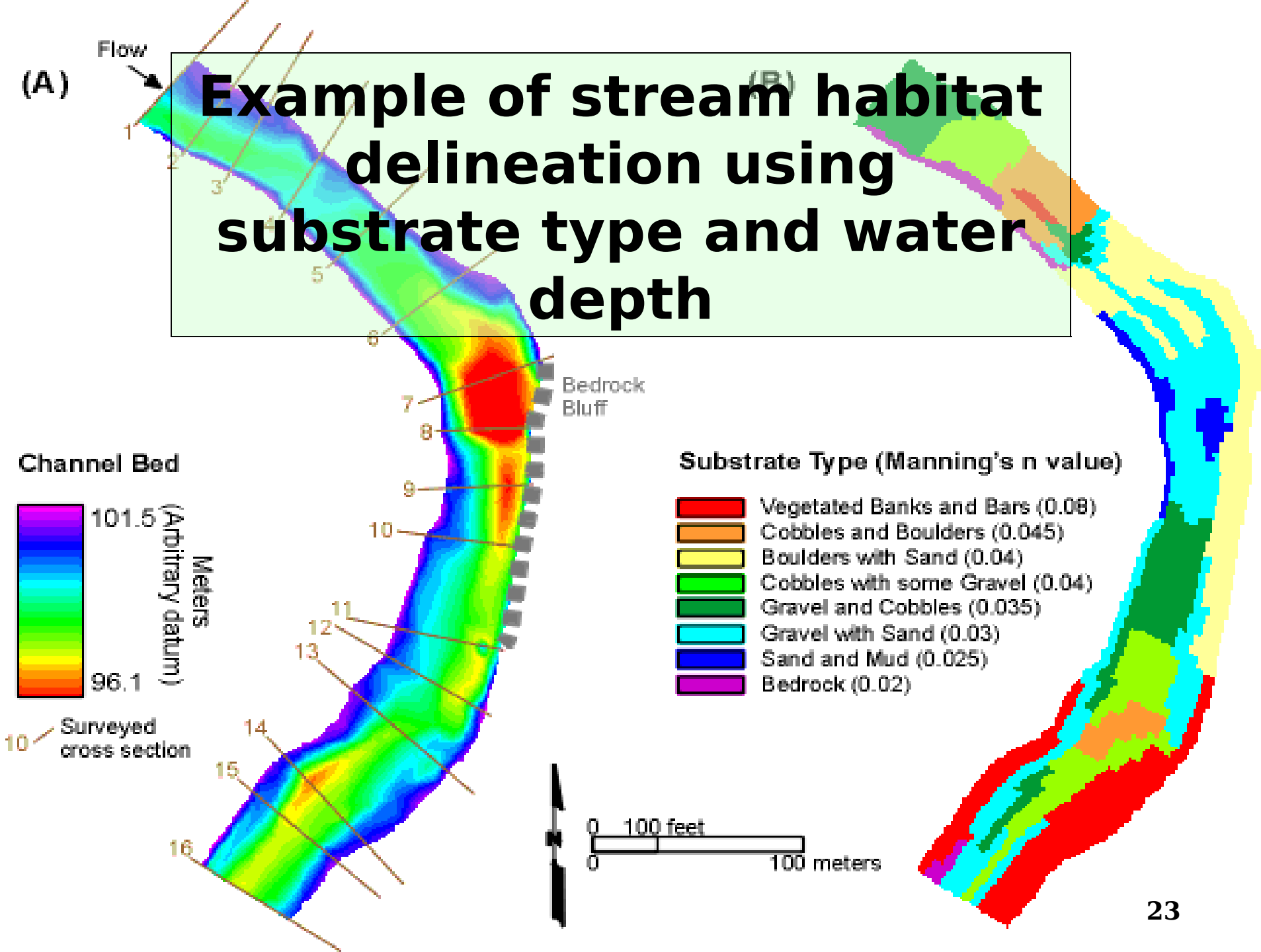
- Commonly Asked Spatial Questions
  - **Acreages**
  - **Total Edge**
  - **Edge Density**
  - **Total Core Area**
  - **Number of Core Areas**
  - **Core Area Distributions**
  - **Patch Distribution and Isolation**
  - **Diversity & Evenness Indices**
  - **Landscape Shape Index**
  - **Patch Size and Density**
  - **Contagion**
  - **Connectivity**
  - **Proximity Index**
  - **Adjacent Land Use**
  - **Interspersion and Juxtaposition**
  - **Types of Human Disturbance**
  - **Landscape Division Index**

Delineation

- Process of marking the boundary between the habitats/cover types.
- Major effort in regulation of wetlands.

Corps 1987 Delineation Manual
http://www.usace.army.mil/cw/cecwo/reg/reg_supp.htm

Example of stream habitat delineation using substrate type and water depth



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Step 4 : Method/Model Selection

PROBLEMS

- What models are available?
- How do I choose models?

SOLUTIONS

- EMRIS, USGS databases, EcoPCX, Univ., other state & federal agencies, Past use, etc.
- Select Models that best match study objectives, significant resources, and available data

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Specify Problems

Inventory and Forecast Conditions

Step 7: Goals & Objectives

- What's a Goal?
  - Goal = vision = desired end result = wish
  - Often mistaken as an objective
  - Usually unobtainable
- What's an Objective?
  - Objective = specific actions, activities, tasks that will allow the goal to be reached
  - Objectives are written with action words
  - They are clear, complete, doable, and measurable
  - aka Success Criteria, Performance Measures, Performance Targets

Specify Problems

Inventory and Forecast Conditions

Example Objective Statement

GOAL: Restore riparian forest

OBJECTIVE:

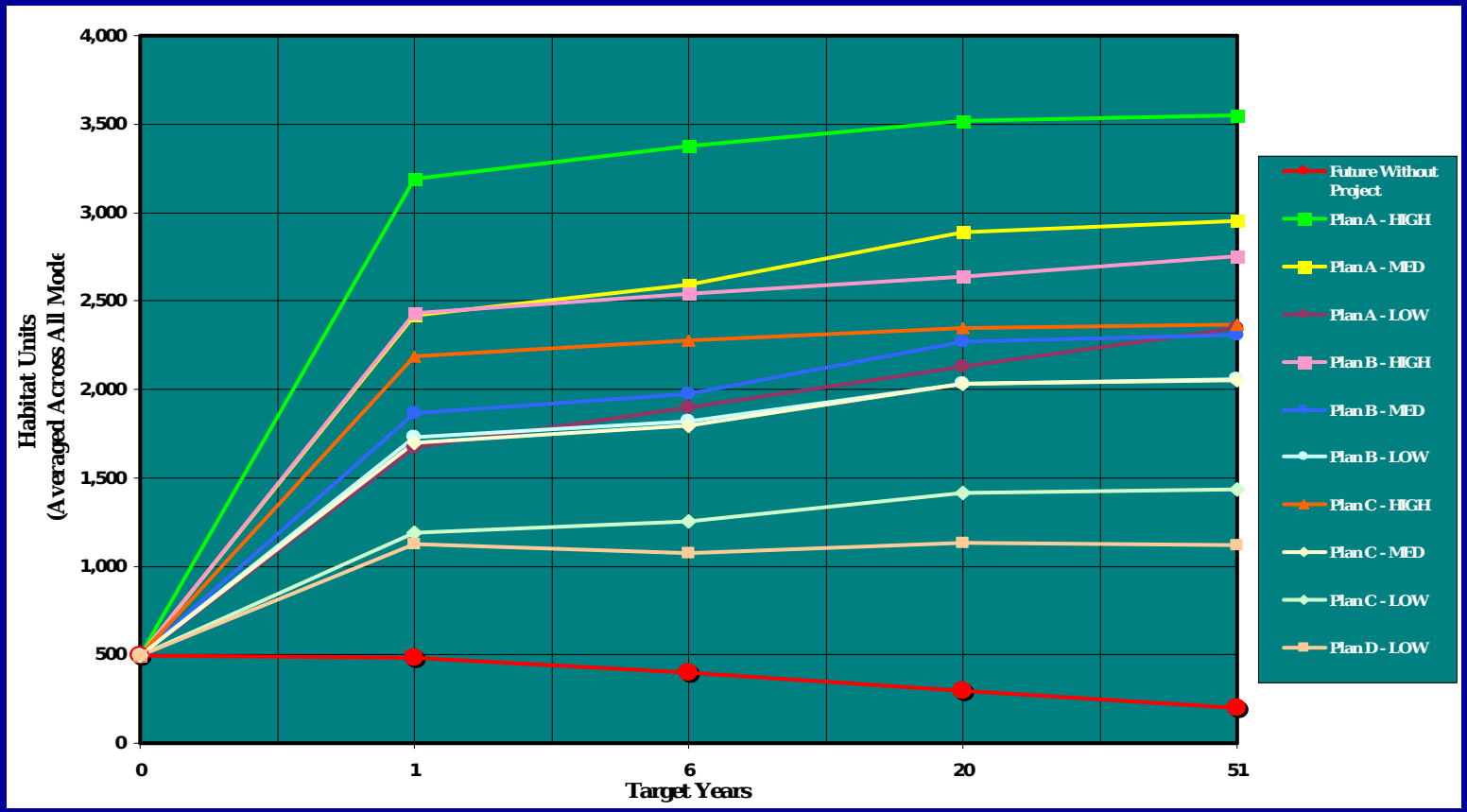
who	The Clear Creek Restoration Project
what	will restore 800 acres of riparian forest to an HSI = 0.85
when	over the next 50 years
where	across the Harris, Brazoria and Galveston Counties on the Clear Creek
why	to restore historic conditions to the system (note shifting baseline)

Compare Alternative Plans

Inventory and Forecast

Evaluate Alternatives

Steps 8 & 9: Forecasting Future WOP & WP Conditions



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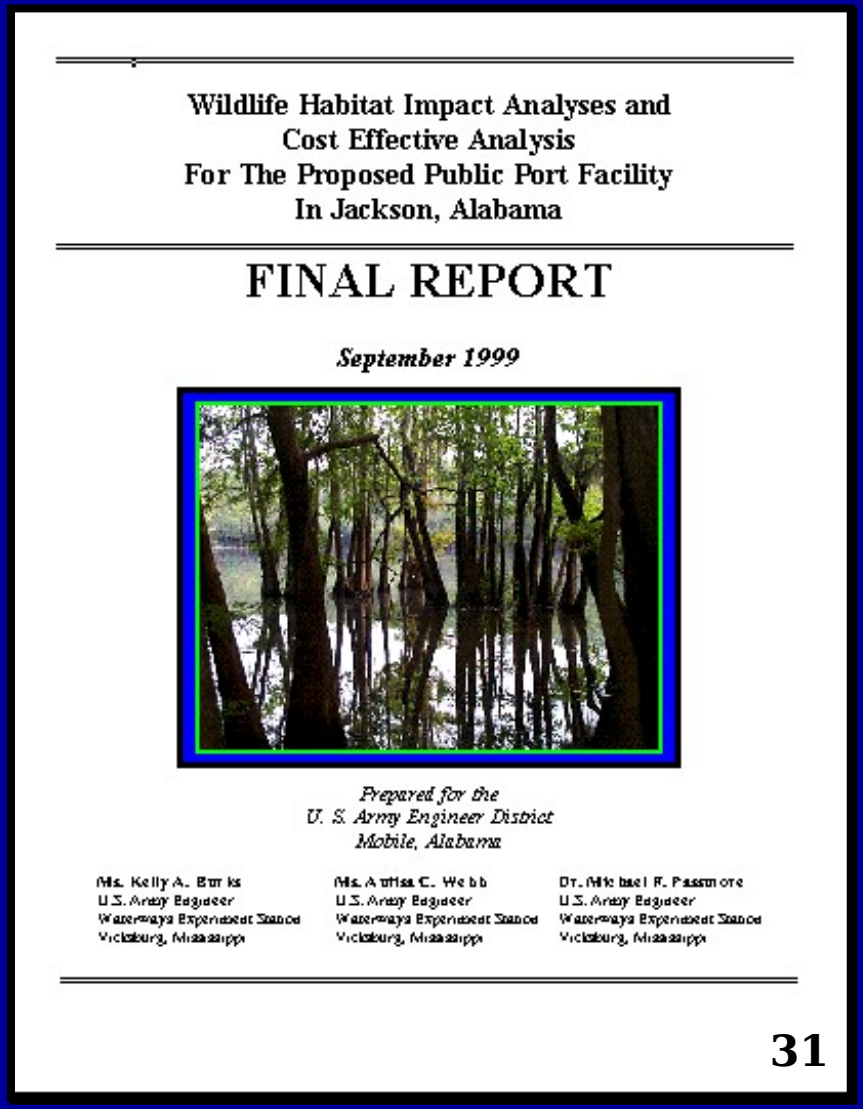
Select Recommended Plan

Step 10: Documentation

- Document throughout the study
  - minutes, notes, every detail
  - Go into the study anticipating Litigation
- Capture assumptions



Wildlife Habitat Impact Analyses and
Cost Effective Analysis
For The Proposed Public Port Facility
In Jackson, Alabama

FINAL REPORT

September 1999

Prepared for the
U. S. Army Engineer District
Mobile, Alabama

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Typical Year's Time Allotment

Oct-Dec	Waiting for funding
Jan-Mar	Method selection
	Cover Types defined
	Model selection &/or development
Apr-Jun	Gather data
	Baseline analysis
Jul-Sep	Refine model
	No Action analysis

Still to do . . .

3-6 mos	Develop Designs
1-3 mos	Evaluate Designs
1-3 mos	ICA/Trade-offs
1 mo	Select Plan
6 mos	Write Report

Take Away Points

- Ecosystem evaluations follow the same 6 step planning process
- Quality x Quantity
- Quality 0 to 1 scale
- HUs calculated for each Target Year for each alternative
- Annualized benefit units used for comparison (AAHU/ AAFCU)

“You got to be very careful if you don’t know where you’re going, because you might not get there.”

Yogi Berra